

said thermal distortion reducing layer contacting said substrate through intervals between crystals.

*MNC7* > 74. (New) A semiconductor device comprising:

a substrate;

a buffer layer comprising a first layer made of  $\text{Al}_{1-s-t}\text{Ga}_s\text{In}_t\text{N}$  ( $0 \leq s \leq 1$ ,  $0 \leq t \leq 1$ ,  $s+t \leq 1$ )

formed on said substrate and a second layer made of  $\text{Al}_{1-u-v}\text{Ga}_u\text{In}_v\text{N}$  ( $0 \leq u \leq 1$ ,  $0 \leq v \leq 1$ ,  $u+v \leq 1$ )

*B2*  
formed to contact said first layer and said substrate and having a chemical formula from that of said first layer;

a first cladding layer formed over said second layer;

an active layer formed over said first cladding layer; and

a second cladding layer formed over said active layer.

75. (New) The semiconductor device according to claim 74, comprising:

said second layer contacting said substrate through intervals in said first layer.

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#### REMARKS

Favorable reconsideration of this reissue application is respectfully requested.

The amendments made above and the remarks below are identical to the amendment filed on June 18, 2002, with the exception being the new claims have been underlined, as requested in the July 11, 2002 Communication.

Claims 1-17, 21 and 23-75 are now present in this application, claims 45-75 being added and claims 18-20 and 22 being canceled by way of the present amendment. Claims 17-23 stand rejected under 35 U.S.C. § 112, first paragraph. Claims 17, 20, 22-24, 26, 29-31, 33, 36 and 37 stand rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. 5,247,533 (Okazaki et al). Claims 21, 28 and

35 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Okazaki et al in view of U.S. 5,290,393 (Nakamura et al). Claims 1-16 and 38-44 have been allowed, claims 25, 27, 32 and 34 would be allowable if rewritten in independent form, and claims 18 and 19 would be allowable if rewritten in independent form and to overcome the § 112 rejection.

First, the Applicants greatly appreciate the allowance of claims 1-16 and 38-44, and the finding of claims 18, 19, 25, 27, 32 and 34 to recite patentable subject matter.

The Applicants also greatly appreciate the several discussions taking place between their representative and Examiner Jackson. First, the Applicants were informed that the Information Disclosure Statement filed November 19, 2001 was not properly matched up with the case and therefore was not considered in the preparation of the first Office Action. The Applicants appreciate Examiner Jackson reviewing these references and making the determination that there was no need to issue a new Office Action.

The Applicants have concurrently filed an Information Disclosure Statement to make of record JP 2-229476 which is to replace JP 5-229476 which was erroneously submitted. The Applicants appreciate working with Examiner Jackson to resolve this issue.

Lastly, the Applicants appreciate the discussions with Examiner Jackson regarding the printing error in claim 1. The formula for the thermal distortion reducing layer in claim 1 as allowed in the patent,  $A1_{1-u-v}Ga_uIn_vN$  ( $0 \leq u \leq 1$ ,  $0 < v \leq 1$ ,  $u+v \leq 1$ ), was printed as  $A1_{1-u-v}Ga_uIn_vN$  ( $0 \leq u \leq 1$ ,  $0 \leq v \leq 1$ ,  $u+v \leq 1$ ), i.e.,  $0 < v \leq 1$  was changed to  $0 \leq v \leq 1$ . Claim 1, in its printed state, has been allowed in this reissue. The Applicants would like to correct the printing error in claim 1 and introduce a claim identical to claim 1 in the printed patent. The appropriate manner of accomplishing this has been under discussion with Examiner Jackson, and the Applicants appreciate the willingness of Examiner Jackson to have an interview after the filing of the response to determine the appropriate way to proceed.

In response to the §112 rejection, claim 17, as originally filed, is supported by the specification. The specification discloses  $A1_{1-u-v}Ga_uIn_vN$  ( $0 \leq u \leq 1$ ,  $0 \leq v \leq 1$ ,  $u+v \leq 1$ ). The group of materials where  $A1_{1-u-v}Ga_uIn_vN$  ( $0 \leq u < 1$ ,  $0 \leq v < 1$ ,  $u+v < 1$ ) is a subset of the disclosed group. In simpler terms, “less than” is included in any group consisting of “less than or equal to,” and the materials recited in original claim 17 is supported by the disclosure. Withdrawal of the §112 rejection is respectfully requested.

In this case, claim 17 contained a typographical error. Claim 17 has been amended to provide a corrected formula for the thermal distortion reducing layer, to correct the typographical error. Claim 17 has been further amended to include the elements of claim 18. Accordingly, claim 17 is believed to be in condition for allowance.

The rejection of claims 24, 26, 28-31, 33 and 35-37 is based primarily on the means language being “functional.” Means claims can recite function without structure, and the claim will be interpreted to cover the corresponding structure disclosed in the specification, and equivalents. *In re Donaldson Co.*, 16 F.3d 1189, 29 USPQ 1845 (Fed. Cir. 1994). Stating that functional language “do[es] not structurally distinguish” over the prior art when a means is recited does not follow the directives of *Donaldson*. A means claim must be examined in accordance with MPEP §§2181-2184 where if a §112, sixth paragraph, element is identified, it *must* be interpreted to cover the corresponding structure, materials or acts in the specification (MPEP §2181, emphasis added). At a minimum, a prior art element that performs the recited function must be found. None of this analysis has been carried out, and reconsideration of claims 24, 26, 28-31, 33 and 35-37 is required and respectfully requested.

Moreover, the cited prior art, Okazaki et al and Nakamura et al do not disclose or suggest any means for controlling polarity of a growth surface, as recited in claims 24 and 31 and thus claims 24, 26, 28-31, 33 and 35-37 are patentable over the cited prior art.

New claims containing allowed or allowable subject matter have been introduced.

New claim 45 includes claim 17 amended to correct the typographical error and the elements of claim 19. Claim 45 is believed to be allowable.

Claim 48 is a combination of amended claim 17 and language of claim 12 defining the crystals to be formed spaced apart. It is believed that claim 48 is also allowable over the prior art.

Claim 51 is a combination of claim 17 and the subject matter of claim 27 defining the crystals to have intervals therebetween so as to expose the substrate. Claim 51 is also believed to be allowable.

Claims 54 and 56 consist of claim 24 combined with claims 25 and 27, respectively. These claims are believed to be in condition for allowance.

Claim 58 is a combination of claim 24 and the language from claim 12 where the crystals are formed spaced apart. Claim 58 is believed to be in condition for allowance.

Claims 60 and 62 consist of claim 24 combined with language from claims 18 and 19, respectively. These claims are also believed to be in condition for allowance.

Claim 64 consists of claim 34 rewritten in independent form. Claim 64 is in condition for allowance.

Claims 66, 68 and 70 consist of claim 31 combined with language from claims 12, 18 and 19, respectively. Each of these claims is believed to be in condition for allowance.

New claim 72 recites a thermal distortion reducing layer formed to contact the crystals and the substrate. Such a layer is not believed to be disclosed in any of the cited prior art.

Claim 74 recites the buffer layer comprising a first layer and a second layer formed to contact the first layer and the substrate. Claim 74 is also believed to be patentable over the prior art.

It is respectfully submitted that the present application is in condition for allowance and a favorable decision to that effect is respectfully requested. It is noted that a Supplemental Reissue Oath will be provided before allowance of the application, as required by the Rules.

Respectfully submitted,

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IN THE CLAIMS

Please amend the claims as follows:

--17. (Amended) A semiconductor device comprising:

a substrate;

crystals formed on said substrate and containing at least Al and N, said crystals being disposed so as to expose portions of said substrate;

a thermal distortion reducing layer made of  $Al_{1-u}Ga_uIn_vN$  [ $(0 \leq u < 1, 0 \leq v < 1, u+v < 1)$ ]  
 $(0 \leq u \leq 1, 0 \leq v \leq 1, u+v \leq 1)$  formed on said crystals and having a different chemical formula from that of said crystals;

a first cladding layer formed over said thermal distortion reducing layer;

an active layer formed over said first cladding layer; and

a second cladding layer formed over said active layer.--

Claims 45-75 (New)